This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-4. (Canceled)

5. (Currently amended) A method for imaging blood flow, comprising the steps of: ~~The method of claim 1~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

waiting a transit delay period before acquiring a first image of the sample;

acquiring the first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample;

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample; and

determining a duration of the transit delay period so as to permit blood having perturbed arterial spins to flow into a tissue, thus causing the blood flow image to be representative of perfusion,

wherein the step of acquiring the first image and the step of acquiring the second image each comprises detecting a magnetic resonance signal reflected off of the sample.

6. (Original) The method of claim 5, wherein the magnetic resonance signal is an analog signal, the method further comprising the steps of:

digitizing the magnetic resonance signal to form a digital magnetic resonance signal; and

measuring the blood flow into the sample based on the digital magnetic resonance signal.

7. (Currently amended) A method for imaging blood flow, comprising the steps of: ~~The method of claim 1~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

waiting a transit delay period before acquiring a first image of the sample;

acquiring the first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample;

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample; and

determining a duration of the transit delay period so as to permit blood having perturbed arterial spins to flow into a tissue, thus causing the blood flow image to be representative of perfusion,

wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency in the range of about 62.5 Hz to about 500 Hz.

8. (Original) The method of claim 7, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

9. (Cancelled)

10. (Currently amended) A method for imaging blood flow, comprising the steps of: ~~The method of claim 9~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

waiting a transit delay period before acquiring a first image of the sample;

acquiring the first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample;

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample; and

determining a duration of the transit delay period so as to ensure that blood having perturbed arterial spins remains in a blood vessel of the sample, thus causing the blood flow image to be representative of large vessel blood flow,

wherein the step of acquiring the first image and the step of acquiring the second image each comprises detecting a magnetic resonance signal reflected off of the sample.

11. (Previously presented) The method of claim 10, wherein the magnetic resonance signal is an analog signal, the method further comprising the steps of:

digitizing the magnetic resonance signal to form a digital magnetic resonance signal; and

measuring the blood flow into the sample based on the digital magnetic resonance signal.

12. (Currently amended) A method for imaging blood flow, comprising the steps of:~~The method of claim 9~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

waiting a transit delay period before acquiring a first image of the sample;

acquiring the first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample; and

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample; and

determining a duration of the transit delay period so as to ensure that blood having perturbed arterial spins remains in a blood vessel of the sample, thus causing the blood flow image to be representative of large vessel blood flow,

wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency in the range of about 62.5 Hz to about 500 Hz.

13. (Previously presented) The method of claim 12, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

14. (Cancelled)

15. (Currently amended) A method for imaging blood flow, comprising the steps of: ~~The method of claim 14, comprising the further step of~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

acquiring a first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample, wherein the step of acquiring the first image and the step of acquiring the second image each comprises detecting an analog magnetic resonance signal reflected off of the sample;

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample;

digitizing the magnetic resonance signal to form a digital magnetic resonance signal;

measuring the blood flow into the sample based on the digital magnetic resonance signal; and

waiting a transit delay period before acquiring the first image of the sample.

16. (Previously presented) The method of claim 15, comprising the further step of determining a duration of the transit delay period so as to permit the blood having perturbed arterial spins to flow into a tissue, thus causing the blood flow image to be representative of perfusion.

17. (Previously presented) The method of claim 15, comprising the further step of determining a duration of the transit delay period so as to ensure that blood having perturbed arterial spins remains in a blood vessel of the sample, thus causing the blood flow image to be representative of large vessel blood flow.

18. (Currently amended) A method for imaging blood flow, comprising the steps of: ~~The method of claim 14,~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

acquiring a first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample, wherein the step of acquiring the first image and the step of acquiring the second image each comprises detecting an analog magnetic resonance signal reflected off of the sample;

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample;

digitizing the magnetic resonance signal to form a digital magnetic resonance signal; and

measuring the blood flow into the sample based on the digital magnetic resonance signal,

wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency in the range of about 62.5 Hz to about 500 Hz.

19. (Previously presented) The method of claim 18, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

20. (Cancelled)

21. (Currently amended) A method for imaging blood flow, comprising the steps of: ~~The method of claim 1, comprising the further step of~~

perturbing arterial spins of blood flowing into a sample by applying a constant RF irradiation together with a magnetic field gradient;

waiting a transit delay period before acquiring a first image of the sample;

acquiring the first image of the sample;

applying amplitude modulated RF irradiation with a magnetic field gradient which, together, mimic the effects of constant RF radiation unrelated to blood flow;

acquiring a second image of the sample;

generating a difference signal based on the first image and the second image that represents a blood flow image of blood flowing into the sample;

determining a duration of the transit delay period so as to permit blood having perturbed arterial spins to flow into a tissue, thus causing the blood flow image to be representative of perfusion, and

waiting a transit delay period before acquiring the first image of the sample.

22. (New) The method of claim 5, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency in the range of about 62.5 Hz to about 500 Hz.

23. (New) The method of claim 22, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

24. (New) The method of claim 7, wherein the step of acquiring the first image and the step of acquiring the second image each comprises detecting a magnetic resonance signal reflected off of the sample, and

wherein the magnetic resonance signal is an analog signal, the method further comprising the steps of:

digitizing the magnetic resonance signal to form a digital magnetic resonance signal; and

measuring the blood flow into the sample based on the digital magnetic resonance signal.

25. (New) The method of claim 24, wherein wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

26. (New) The method of claim 10, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency in the range of about 62.5 Hz to about 500 Hz.

27. (New) The method of claim 26, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

28 (New) The method of claim 26,

wherein the magnetic resonance signal is an analog signal, the method further comprising the steps of:

digitizing the magnetic resonance signal to form a digital magnetic resonance signal; and

measuring the blood flow into the sample based on the digital magnetic resonance signal.

29. (New) The method of claim 28, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

30. (New) The method of claim 15, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency in the range of about 62.5 Hz to about 500 Hz.

31. (New) The method of claim 30, wherein the step of applying amplitude modulated RF irradiation comprises applying amplitude modulated RF irradiation having a modulation frequency of about 62.5 Hz.

32. (New) The method of claim 31, further comprising the steps of:
determining a duration of the transit delay period so as to permit the blood having perturbed arterial spins to flow into a tissue, thus causing the blood flow image to be representative of perfusion.

33. (New) The method of claim 31, further comprising the step of:
determining a duration of the transit delay period so as to ensure that blood having perturbed arterial spins remains in a blood vessel of the sample, thus causing the blood flow image to be representative of large vessel blood flow.

34. (New) The method of claim 30, further comprising the step of:
determining a duration of the transit delay period so as to permit the blood having perturbed arterial spins to flow into a tissue, thus causing the blood flow image to be representative of perfusion.

35. (New) The method of claim 30, further comprising the step of:
determining a duration of the transit delay period so as to ensure that blood having perturbed arterial spins remains in a blood vessel of the sample, thus causing the blood flow image to be representative of large vessel blood flow.